



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/527,517	08/22/2005	Olivier J. F. Martin	ABAGP0115US	9932
43076 7590 08/07/2007 MARK D. SARALINO (GENERAL) RENNER, OTTO, BOISSELLE & SKLAR, LLP 1621 EUCLID AVENUE, NINETEENTH FLOOR CLEVELAND, OH 44115-2191			EXAMINER SAHU, MEENAKSHI S	
			ART UNIT 2809	PAPER NUMBER
			MAIL DATE 08/07/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/527,517

Applicant(s)

MARTIN, OLIVIER J. F.

Examiner

Meenakshi S. Sahu

Art Unit

2809

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 August 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/10/2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 3/10/2005
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 6 to 8, 10 to 20 are rejected under 35 U.S.C. 102(b) as anticipated by Stark (US 20020056816).

**Regarding claims 1 and 16,** Stark discloses a structure and a method for producing a localized light source in a medium [abstract], comprising a source generating incident light ["incident light" – abstract, paras 19, 21, 22, and 50, element 231 in fig 21 and para 69, element 340 in fig 22 and para 73, and "source of electromagnetic radiation" in claim 1], a surface-plasmon-supporting layer ["metallic film layer" -- abstract, paras 56 and 66, claim 3], means for transmitting and localizing plasmons between the surface-plasmon-supporting layer and the medium, where the transmitter-localizer means includes a discontinuity between surface-plasmon-supporting layer for providing a localized electromagnetic field deviation [abstract, para 56 and 57, claim 1], and a plasmon-transmitting interface with predetermined electromagnetic properties [para 18] at the medium where the incident light excites a surface plasmon in the surface-

plasmon-supporting layer. The plasmon in turn produces a localized light source at the plasmon-transmitting interface by localizing the energy of the surface plasmon [abstract, para 18, claims 1 and 2].

**Regarding claim 2**, Stark discloses a discontinuity for providing a localized electromagnetic field deviation which is a physical discontinuity localizing the electromagnetic field associated with a plasmon generated by said surface-plasmon-supporting layer ["aperture" – abstract, paras 18 and 56, claim 1].

**Regarding claim 6**, Stark discloses a substrate carrying the surface-plasmon-supporting layer and the transmitter localizer, and providing a transfer of the incident light [para 56].

**Regarding claim 7**, Stark discloses a surface-plasmon-supporting layer is that is made of two or more different materials [para 63].

**Regarding claim 8**, Stark discloses a plurality of sources for generating incident light that is provided for simultaneous or sequential use [para 15].

**Regarding claim 10**, Stark discloses additional surface-plasmon-supporting layers for enhancing the localized light source [fig 13, para 60].

**Regarding claim 11**, Stark discloses the various layers and elements of said structure are structured, in particular curved, to enable generating the localized light source in one or several locations of the plasmon-transmitting interface to the medium

Art Unit: 2809

["stylus" para 10].

**Regarding claim 12**, Stark discloses that the width and/or length of the means for localizing the generated plasmon, in particular of the protrusion, is a fraction of the wavelength of the localized light source, preferably less than about one tenth of said wavelength [para 10].

**Regarding claim 13**, Stark discloses the surface plasmon-supporting layer consists of or includes any of gold, silver and/or copper [para 66].

**Regarding claim 14**, Stark discloses the surface plasmon-supporting layer consists of or includes a metal, preferably aluminum [para 66].

**Regarding claim 15**, Stark discloses the surface plasmon-supporting layer consists of or includes a metal and/or a metal-oxide mixture, preferably indium tin oxide [para 66].

**Regarding claims 17 and 18**, Stark discloses a localized light source, where surface plasmons are excited only on the side of the surface plasmon-supporting element attached to the plasmon transmission means [para 56, fig 4] and on both sides of the surface plasmon-supporting element [para 19].

In the specifications it is stated that a surface plasmon is generated from the bottom surface of the surface plasmon-supporting element but there is no mention of the plasmons being excited from both surfaces of the surface plasmon-supporting element. However given the fact a dielectric material is placed on lower surface of the conductive plasmon generating layer to prevent a build up of plasmons near the aperture openings

Art Unit: 2809

[para 19] indicates that plasmons are excited on both sides of the conductive layer or surface plasmon-supporting element.

**Regarding claims 19 and 20**, Stark discloses the structure and method for optical lithography and/or optical data storage and/or high resolution optical microscopy and/or biochips [paras 123, 68, 72 and 120]

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stark as applied to claim 1 above, and in view of Carr et al. ("Sub-Micron Optical Sources for the Single Macromolecule Detection", Proceedings of the SPIE, vol 1796, 8 September 1992, pages 152 to 156).

**Regarding claims 3 and 4**, Stark fails to explicitly disclose the discontinuity consists of or includes one or more protrusions or inclusions.

However Carr et al. teaches that the microscopic holes or apertures are protrusions or

Art Unit: 2809

asperities (microscopic material inconsistencies) [page 153, section 3].

Given the teachings of Carr et al. it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Stark to include protrusions.

Doing so would allow other shapes and topologies for the aperture in order to achieve localized light sources.

5. Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stark as applied to claim 1 above, and in view of Paulus et al. ("Light propagation and scattering in stratified media; a Green's tensor approach" Journal of the Optical Society of America, vol 18, no. 4, April 2001, pages 854 – 861).

**Regarding claim 5**, Stark fails to explicitly disclose a grating, for enhancing the generation of surface plasmons by the surface-plasmon-supporting layer.

However Paulus et al. teaches that a grating can be used on the top of a stratified background [page 854, section 1].

Given the teachings of Paulus et al. it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Stark to include a grating.

Doing so would allow wider application of the surface-plasmon illumination system.

**Regarding claim 9**, Stark fails to explicitly disclose that the surface-plasmon-supporting layer consists or comprises a plurality of patches or strips which are

Art Unit: 2809

individually addressable.

However Paulus et al. teaches that a metallic profile can be used as the surface-plasmon-supporting layer [page 854, section 1].

Given the teachings of Paulus et al. it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Stark to include a plurality of strips or patches for the the surface-plasmon-supporting layer.

Doing so would allow wider application of the surface-plasmon illumination system, particularly in the field of photolithography.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure is Stark et al. (US 6,818,907).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Meenakshi S. Sahu whose telephone number is 571-270-1301. The examiner can normally be reached on Monday - Friday 8AM - 5PM est.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrell L. McKinnon can be reached on 571-272-4797. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2809

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Meenakshi S. Sahu  
August 1, 2007



LISA CAPUTO  
PRIMARY PATENT EXAMINER